

# 6 cm Single Tile Processing System

Dean R. Walters

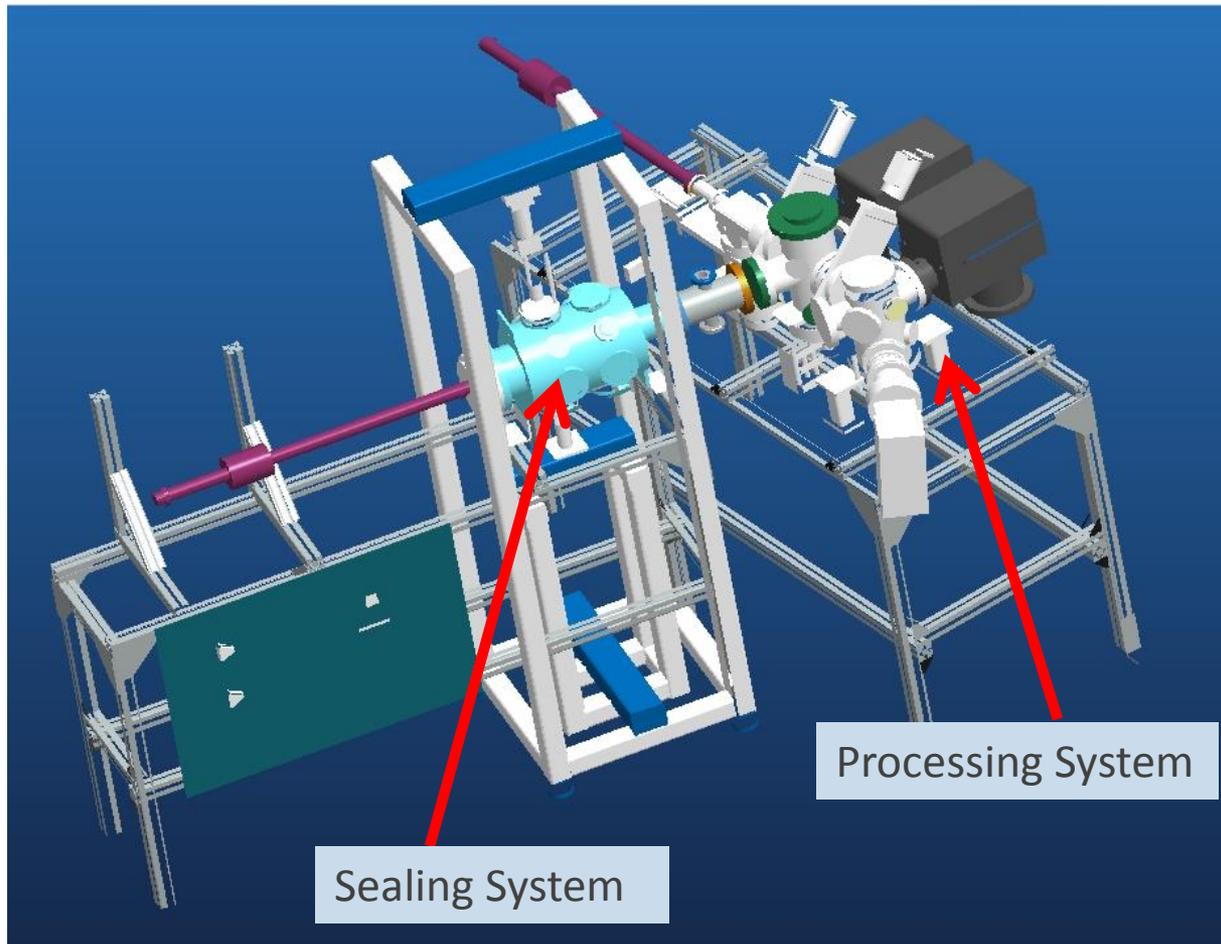
Argonne National Laboratory

# Outline

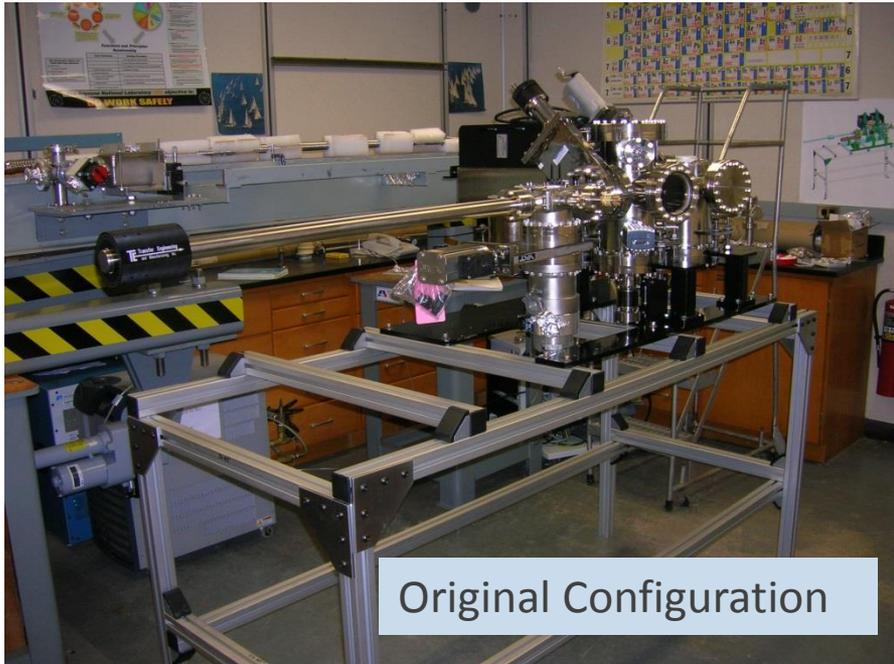
- Tile Processing Facility
- 6 cm Processing System
- Deposition Sub-System
- Scrubbing Sub-System
- Schedule
- Conclusions

# 6 cm Tile Processing System

The merging of the Sealing System and the Processing System



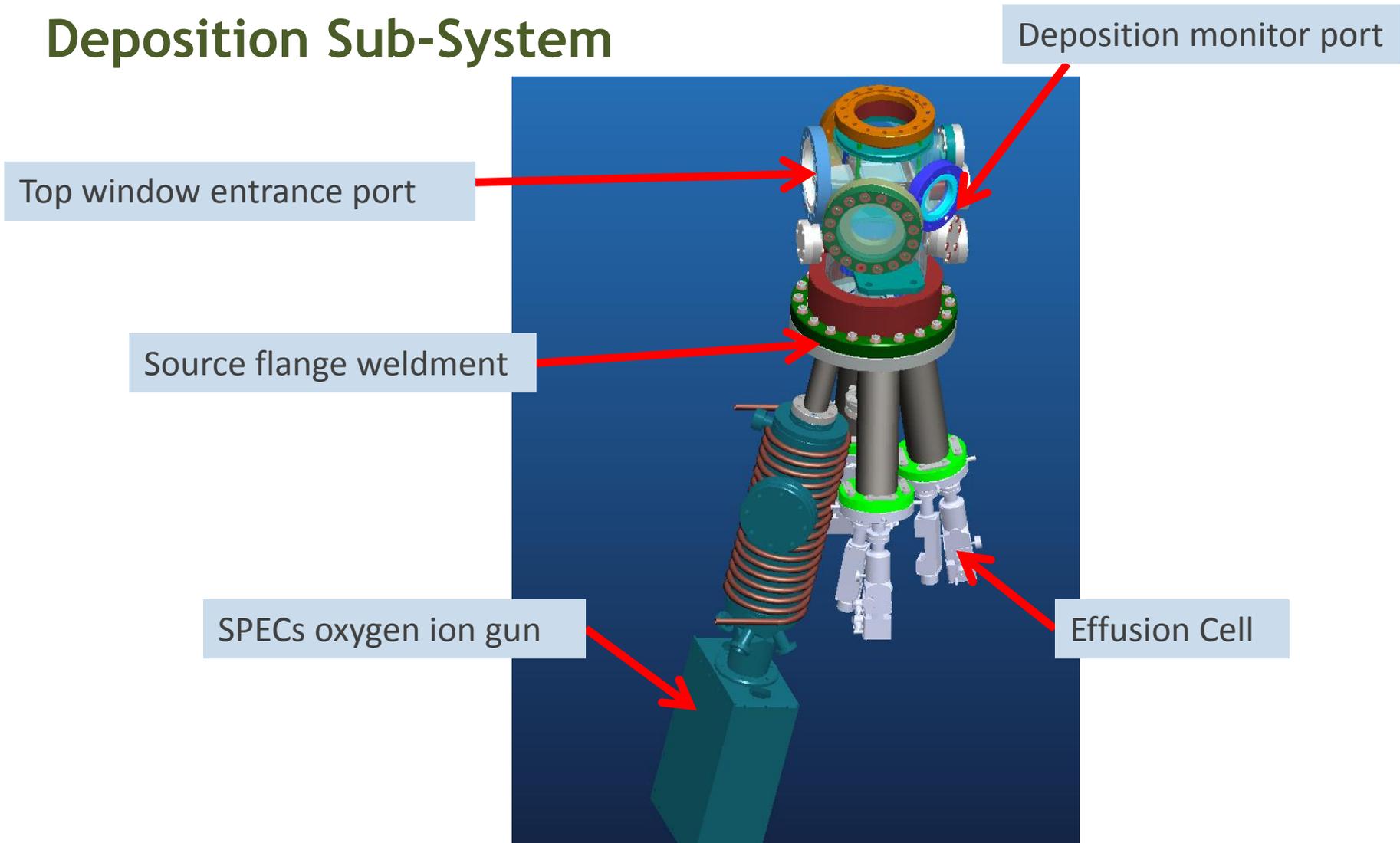
# Current condition of the 6 cm Tile Processing System



System was originally designed to do Cs-Te studies.



# Deposition Sub-System



Multialkali photocathodes grown by molecular beam epitaxy technique, I. A. Dubovoi, A. S. Chernikov, Alexander M. Prokhorov, Mikhail Y. Schelev, Victor N. Ushakov, Proc. SPIE 1358, 19th Intl Congress on High-Speed Photography and Photonics, 134 (April 1, 1991)

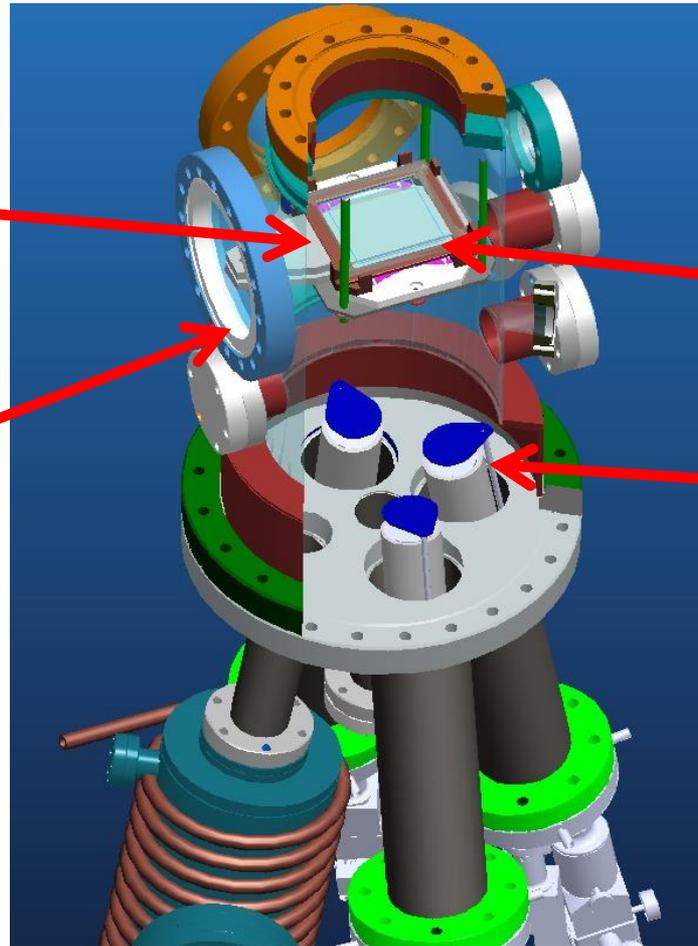
# Deposition Sub-System

Top window sitting on top of transport spatula

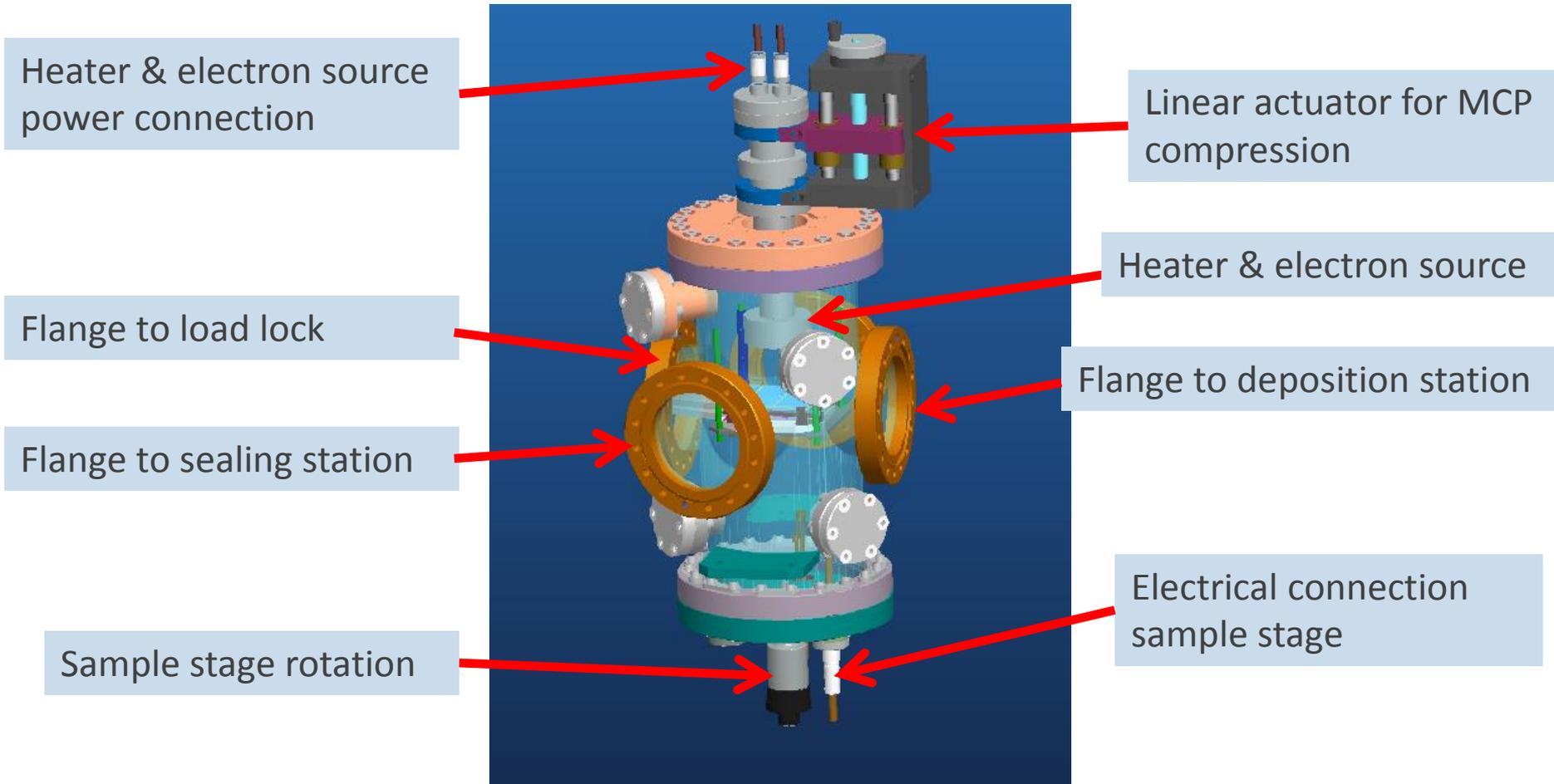
Flange to scrubber station

Top window mount in transport frame

Effusion cell with integrated shutter



# Scrubbing System



Colera, I.; Gonzalez, R.; Soria, E.; de Segovia, J. L.; Roman, E. L.; and Chen, Y.; *J. Vac. Sci. Technol. A*, **1997**, 15, 1698-03.

# Task List

- Spatula was made in house and it needs to be fit to the vertical adjustment section of the transfer arm.
- ANL commissioned flux distribution study, waiting on results before doing final machining step on deposition chamber.

3" Single Tile System			
<b>Vacuum Transfer System</b>			
2.1	3STS2110	Move 2-Chamber Vacuum Transfer System	Complete
2.1	3STS2120	Sample Handling Design	Complete
2.1	3STS2130	Procure Sample Handling Components	
2.1	3STS2140	Install Sample Handling Components	Initial fit-up, clean , and bake needs to be done
2.1	3STS2150	Sample Handling Verification	
2.1	3STS2160	Assemble 2-Chamber Vacuum System	
2.1	3STS2180	Move Sealing Chamber	
2.1	3STS2170	Test 2-Chamber Vacuum System	
2.1	3STS2190	Join Sealing Chamber to 2-Chamber Vacuum System	
<b>Photocathode Subsystem</b>			
2.2	3STS2220	Design Source Flange	Complete
2.2	3STS2210	Design Modification of Cathode Chamber	
2.2	3STS2230	Procure Photocathode Components	Effusion cells order in Purchasing awaiting release
2.2	3STS2240	Modification of Cathode Chamber	First machining* complete
2.2	3STS2260	Delivery of Photocathode Components	
2.2	3STS2250	Cleaning & Reinstallation of Cathode Chamber	
2.2	3STS2270	Assemble of Photocathode Internals	
2.2	3STS2280	Test Photocathode Fabrication System	
<b>MCP Scrubbing Subsystem</b>			
2.3	3STS2310	Investigate Scrub Process/Write Spec	In Process
2.3	3STS2320	Bake and Scrub Design	
2.3	3STS2330	Procure Bake and Scrub Components	Consulting with vendor
2.3	3STS2340	Delivery of Bake and Scrub Components	
2.3	3STS2350	Assembly of Bake and Scrub Internals	
2.3	3STS2360	Test Bake and Scrub Station	
<b>Detector Sealing Subsystem</b>			
2.4	3STS2410	Sealing Technique Development	In Process, see M. Kufer talk
2.4	3STS2420	Select and Purchase Hydraulic Pump	Complete
2.4	3STS2430	Design Sealing System	
2.4	3STS2440	Procure Sealing Chamber Components	
2.4	3STS2450	Delivery of Sealing Chamber Components	
2.4	3STS2460	Assembly of Sealing Chamber Components	
2.4	3STS2470	Sample Registration Testing	
2.4	3STS2480	Testing of Sealing in Air	
2.4	3STS2490	Testing of Sealing in Vacuum	
<b>3" Tile Integration</b>			
2.5	3STS2510	Commissioning 3" Tile system	
2.5	3STS2520	Produce First 3" Tile	
2.5	3STS2525	First 3" Tile Complete	
2.5	3STS2530	Produce 3" Tiles	
2.5	3STS2540	QA 3" Tiles	
2.5	3STS2550	Achieve 10 Tiles	

# Conclusions

- Progress on the design and the development of the system is going slower than anticipated but progress is being made.
- Once the flux calculations are received then the final modifications to the deposition chamber can be made. The modifications should take 1 month to complete.
- At this point there is no anticipated modifications to the scrubber chamber. Components for the scrubber station are being connected using the existing flanges. The new rotation and scrubber assemblies are being bolted onto the system using the 8 inch top and bottom flanges.
- Indium seal tests are expected to be completed shortly and once that occurs then the system can be moved into the laboratory. Work has already started on spec'ing out the transfer arm for the sealing station. That is expected soon and the lead time on the arm is ~4 weeks.

## Time Table

- Large orders are now being held up due to overall ANL financial concerns.
- The effusion cells are just one of a few items that are needed to have an operational system, e.g. transfer arms, heaters, and an electron source. The effusion cell is the longest lead item at 12 weeks.
- At the point of effusion cell arrival the system can be made operational in 2-3 months from then.

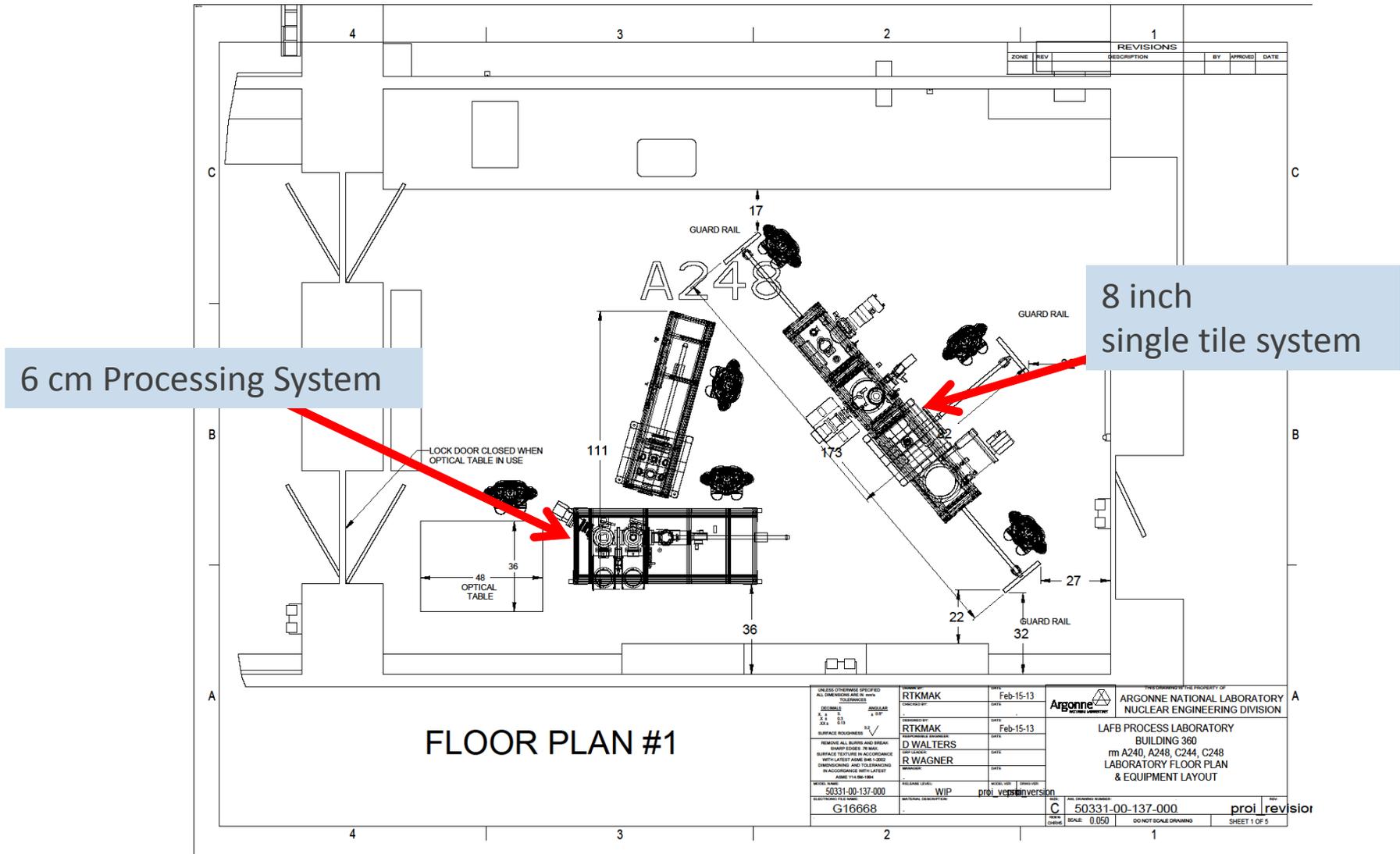
# Thank-you

## Acknowledgements

### Single Tile Processing System Team:

- Karen Byrum
- Marcel Demarteau
- Ron Kmak
- Marc Kupfer
- Ed May
- John Noonan
- Frank Skrzecz
- Robert Wagner
- Junqi Xie

# Location of the two planned systems in A-248



# Systems in A-248

- Cad Model of the Lab

